

What Is Claimed Is:

1. A packaging member for forming at least part of a hermetic package, said packaging member having a portion thereof for forming an interior surface of a hermetic package and having  
5 at least one side wall which at least partly defines an opening therethrough, said packaging member comprising:

an optical element passing through said opening in said packaging member;

a bonding material bonding said optical element to at  
10 least a portion of said one side wall of said packaging member, said bonding material having a surface adjacent said portion of said housing member for forming an interior surface, said bonding material being prone to emission of undesirable components into the interior of the hermetic package; and

15 a layer of sealing material covering said surface of said bonding material adjacent said portion of said housing member, said layer of sealing material being one which is not prone to emission of undesirable components and which limits undesirable components emitted from the bonding material from  
20 entering the interior of the hermetic package.

2. The packaging member of claim 1 wherein said bonding material is epoxy resin.

3. The packaging member of claim 1 wherein said sealing material is metal.

25 4. The packaging member of claim 1 wherein said optical element is an optical fiber.

5. The packaging member of claim 1 wherein said bonding material is recessed in said opening such that the bonding material does not extend beyond said portion forming an interior surface.

5 6. Array apparatus comprising:

a substrate capable of supporting an array of N spaced-apart elements and having first and second opposing surfaces and defining a plurality of N substrate apertures which each extend therethrough from the first surface to the second surface with a cross-section of each of the N substrate apertures being greater than a cross-section of an element such that one element can be passed through in each of the N primary substrate apertures; and

N elements, each one of the elements having first and second ends and passing through one of the N spaced-apart apertures in the substrate with the second end extending sufficiently through an aperture in the substrate to have a surface that is at least essentially common with the second surface of the substrate;

a bonding material located in each aperture in the substrate and bonding each element to the substrate, said bonding material having a surface adjacent the second surface of the substrate and being prone to emission of undesirable components through said adjacent surface; and

a layer of sealing material covering said adjacent surface of said bonding material, said sealing material being one that is not prone to emitting undesirable components and which

limits the emitted undesirable components from the bonding material from passing therethrough.

7. The array apparatus of claim 6 wherein the elements are optical elements.

5 8. Optical fiber array apparatus comprising:

a substrate capable of supporting an array of N spaced-apart optical fibers and having first and second opposing surfaces and defining a plurality of N substrate apertures which each extend therethrough from the first surface to the second  
10 surface with a cross-section of each of the N substrate apertures being greater than a cross-section of an optical fiber such that one optical fiber can be passed through in each of the N substrate apertures; and

N optical fibers, each one of the optical fibers having  
15 an end that passes through one of the N spaced-apart apertures in the substrate with the end extending sufficiently through an aperture in the substrate to have a surface that is at least essentially common with the second surface of the substrate;

a bonding material located in each aperture in the  
20 substrate and bonding each optical fiber to the substrate, said bonding material having a surface adjacent the second surface of the substrate and being prone to emission of undesirable components through said adjacent surface; and

a layer of sealing material covering said adjacent  
25 surface of said bonding material, said sealing material being one which is not prone to emitting undesirable components and which

limits the emission of undesirable components from the bonding material from passing therethrough.

9. The optical fiber array of claim 8 wherein the sealing material is metal.

5. 10. A hermetic package comprising:

a packaging member for forming at least part of a hermetic package, said packaging member having a portion thereof for forming an interior surface of a hermetic package;

said packaging member defining an opening extending  
10 therethrough;

an optical element passing through said opening in said packaging member;

a bonding material which bonds said optical element to said packaging member, said bonding material having a surface  
15 adjacent said portion of said housing member for forming an interior surface, said bonding material being prone to emission of undesirable components into the interior of the hermetic package; and

a layer of sealing material on and covering said  
20 surface of said bonding material adjacent said portion of said housing member, said layer of sealing material not being prone to emitting undesirable components and limiting undesirable components emitted by said bonding material from entering the interior of the hermetic package; and

25 an additional member attached to said packaging member to form a complete hermetically sealed package.

11. The hermetic package of claim 10 wherein said bonding material is epoxy resin.

12. The hermetic package of claim 10 wherein said sealing material is metal.

5 13. The hermetic package member of claim 10 wherein said optical element is an optical fiber.

10 14. The hermetic package of claim 10 wherein said bonding material is recessed in said opening such that the bonding material does not extend beyond said portion forming an interior surface.

15 15. A process of sealing an optical element bonded to a support member using bonding material comprising the steps of:

placing an optical element through an opening in the support member with the cross-section of the opening being greater than the cross-section of the optical element and with the optical element projecting beyond said support member;

filling a space between said optical element and said support member with a bonding material which is prone to emit undesirable components;

20 coating said bonding material and the projecting portion of said optical element with a layer of material which is not prone to emitting undesirable components and which limits passage of any undesirable components emitted by said bonding material; and

25 removing that portion of said layer of material which coats said projecting portion of said optical element while

leaving that portion of said layer of material which coats said bonding material intact.

16. The process of claim 15 further comprising the step of removing a portion of said bonding material, prior to the step of  
5 coating with said layer of material, so as to leave said bonding material recessed below the surface of said support member.

17. The process of claim 16 wherein said step of removing that portion of said layer of material which coats said projecting portion of said optical element also removes said  
10 projecting portion of said optical element to leave said optical element flush with the surface of said support member.

18. The process of claim 15 wherein said bonding material is epoxy resin.

19. The process of claim 15 wherein said sealing material  
15 is metal.

20. The process of claim 15 wherein said optical element is an optical fiber.

21. A packaging member which has a portion thereof for forming an interior surface of a hermetic package and which  
20 defines an opening therethrough, said packaging member comprising:

an optical fiber passing through said opening in said packaging member;

an epoxy resin bonding material bonding said optical  
25 element to said packaging member, said epoxy resin bonding material having a surface adjacent said portion of said housing member for forming an interior surface, said bonding material

being prone to emission of undesirable components into the interior of the hermetic package; and

a layer of sealing material on and covering said surface of said bonding material adjacent said portion of said housing member, said sealing material being one which limits emission of undesirable components into an interior of a hermetic package of which the packaging member forms a part, said layer of sealing material limiting undesirable components emitted by said bonding material from entering the interior of the hermetic package and being selected from the group consisting of chromium, copper, gold, tungsten, titanium, nickel, and aluminum, and having a thickness of about 0.03 microns or greater.

22. A process of sealing an optical fiber bonded to a support member with epoxy resin bonding material comprising the steps of:

placing an optical fiber through an opening in the support member which has a cross-section which is greater than the cross-section of the optical fiber such that there is a space between the optical fiber and the support member, and the optical fiber projects beyond a surface of said support member;

filling said space between said optical fiber and said support member with an epoxy resin bonding material which is prone to emit undesirable components;

removing a portion of said epoxy resin bonding material so as to leave said bonding material recessed below the surface of said support member;

coating said epoxy resin bonding material and the projecting portion of said optical fiber with a layer of material which layer limits passage of any undesirable components emitted by said epoxy resin bonding material; and

5 removing that portion of said layer of material which coats said projecting portion of said optical fiber while leaving that portion of said layer of material which coats said bonding material intact and also removing said projecting portion of said optical element to leave said optical element flush with the  
10 surface of said support member.

23. A packaging member, which forms at least part of a hermetic package that defines an opening therethrough and has a portion thereof for forming an interior surface of the hermetic package, said packaging member comprising:

15 a connector element passing through said opening in said packaging member;

a bonding material bonding said connector element to said packaging member, said bonding material having a surface adjacent said portion of said packaging member for forming an  
20 interior surface, said bonding material being prone to emission of undesirable components into the interior of the hermetic package; and

a layer of sealing material on and covering said surface of said bonding material adjacent said portion of said  
25 housing member, said layer of sealing material not being prone to emitting undesirable components and limiting undesirable



components emitted by said bonding material from entering the interior of the hermetic package.

24. The packaging member of claim 23 wherein said connector element is an optical element.

5 25. The packaging member of claim 24 wherein said optical element is an optical fiber.

26. The packaging member of claim 23 wherein said connector element is an electrical connector.

10 27. The packaging member of claim 26, wherein said sealing material is electrically insulating.

28. The packaging member of claim 23 wherein said bonding material is an epoxy resin.

29. The packaging member of claim 23 wherein said sealing material is metal.

15 30. The packaging member of claim 23 wherein said bonding material is recessed in said opening such that the bonding material does not extend beyond said portion forming an interior surface.

20 31. A process of sealing an element to a support member using bonding material comprising the steps of:

placing an element through an opening in the support member with the cross-section of the opening being greater than the cross-section of the element and with the element projecting beyond said support member;

25 filling a space between said element and said support member with a bonding material which is prone to emit undesirable components;

coating said bonding material and the projecting  
portion of said element with a layer of sealing material which is  
not prone to emitting undesirable components and which limits  
passage of any undesirable components emitted by said bonding  
5 material; and

removing that portion of said layer of sealing material  
which coats said projecting portion of said element while leaving  
that portion of said layer of material which coats said bonding  
material essentially intact.

10 32. A process of sealing an element bonded to a support  
member using epoxy resin bonding material comprising the steps  
of:

placing an element through an opening in the support  
member which has a cross-section which is greater than the cross-  
15 section of the element such that there is a space between the  
element and said support member, and the element projects beyond  
a surface of said support member;

filling said space between said element and said  
support member with an epoxy resin bonding material which is  
20 prone to emit undesirable components;

removing a portion of said epoxy resin bonding material  
so as to leave said bonding material recessed below the surface  
of said support member;

coating said epoxy resin bonding material and the  
25 projecting portion of said element with a layer of a sealing  
material which is not prone to emitting undesirable components

and which limits passage of any undesirable components emitted by said epoxy resin bonding material; and

removing that portion of said layer of sealing material which coats said projecting portion of said element while leaving  
5 that portion of said layer of sealing material which coats said bonding material essentially intact and also removing said projecting portion of said element to leave said element flush with the surface of said support member.